



Dart Aerospace Ltd.
1270 Aberdeen St
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K6A 1K7
Canada

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D119-796-141
Job Sheet 187562



Part No: D119-796-141

Job Qty: 1 pcs

Part Name: Fwd Crosstube Installation Without Step (No Hardware)



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 12/7/18

Job Tracking No:

Due Date: 1/11/19

Created By: Jesse White

Type: Stock

Description:

Note: DRWG D119-795-141 REV.H IPP REV:C 14.11.19 AS PER REV.C DD VERF:JLM IPP REV:D 14.12.12 AS PER REV.pd1 DD VERF:JLM IPP REV:E 15.02.11 AS PER REV F JLM VERIFIED BY:DD

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier	Sign-off
					Setup	Run		
					Hrs	Hrs	Workcenter / Supplier Lead Time	
130	Crosstubes - Bend - 1	1 pcs	1/11/19	1/11/19	0.00	3.85	Crosstubes - Bend	GP 19-02-22
140	QC 15	1 pcs	1/11/19	1/11/19	0.00	0.00	QC 15 - 12	
							QC 15 - 3	
							QC 15 - 38	
							QC 15 - 47	
							QC 15 - 49	
							QC 15 - 58	
							QC 15 - 9	FEB 22 2019 PD
145	Crosstubes - 2 - B4B	1 pcs	1/11/19	1/11/19	0.00	3.06	Crosstubes - 1 - B4B	
							Crosstubes - 2 - B4B	GP 19-02-26
							Crosstubes - 3 - B4B	
							Crosstubes - 4 - B4B	
							Crosstubes - 5 - B4B	
							Crosstubes - 6 - B4B	
150	Crosstubes - 3 - B4B	1 pcs	1/11/19	1/11/19	0.00	3.06	Crosstubes - 1 - B4B	
							Crosstubes - 2 - B4B	
							Crosstubes - 3 - B4B	GP 19-02-26
							Crosstubes - 4 - B4B	
							Crosstubes - 5 - B4B	
							Crosstubes - 6 - B4B	
160	Crosstubes - 4 - B4B	1 pcs	1/11/19	1/11/19	0.00	1.49	Crosstubes - 1 - B4B	
							Crosstubes - 2 - B4B	
							Crosstubes - 3 - B4B	
							Crosstubes - 4 - B4B	GP 19-02-26
							Crosstubes - 5 - B4B	
							Crosstubes - 6 - B4B	
175	QC 7	1 pcs	1/11/19	1/11/19	0.00	0.00	QC 7 - 10	
							QC 7 - 13	
							QC 7 - 14	
							QC 7 - 15	



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Container No: S155800



Part: D119-796-141

Job No: 187562

Serial No/Batch: S155800

Revision: F,H

Inspector:

Exp Date:

Instructions: TC STC SH14-45-1, Issue 1, EASA STC SR03504NY 15/01/28, EASA

				QC 7 - 17	
				QC 7 - 18	
				QC 7 - 19	
				QC 7 - 2	
				QC 7 - 28	
				QC 7 - 3	
				QC 7 - 30	
				QC 7 - 34	
				QC 7 - 36	
				QC 7 - 37	
				QC 7 - 38	
				QC 7 - 41	
				QC 7 - 47	
				QC 7 - 48	
				QC 7 - 51	
				QC 7 - 58	
				QC 7 - 59	
				QC 7 - 6	
				QC 7 - 60	
				QC 7 - 9	
				QC 7 - 68	DAS
				QC 7 - 50	67
				QC 7 - 67	9-89 19-02-27
180 Outsource - 2 - NDT per QSI038 1 pcs	1/11/19		SKY002-VC	7004223	MAR 12 2019
190 Packaging 2-1 - Receive - B4B 1 pcs	1/11/19	0.00 0.00	Packaging 2 - 1 - B4B		
			Packaging 2 - 2 - B4B		
			Packaging 2 - 3 - B4B		
			Packaging 2 - 5 - B4B		
			Packaging 2 - 4 - B4B		MAR 13 2019
			Packaging 2 - 6 - B4B		
			Packaging 2 - 7 - B4B		
			Packaging 2 - 8 - B4B		
			Packaging 2 - 9 - B4B		
			Packaging 2 - 10 - B4B		
			Packaging 2 - 11 - B4B		
			Packaging 2 - 12 - B4B		
			Packaging 2 - 13 - B4B		
			Packaging 2 - 14 - B4B		
			Packaging 2 - 15 - B4B		
			Packaging 2 - 16 - B4B		
			Packaging 2 - 17 - B4B		
			Packaging 2 - 18 - B4B		
			Packaging 2 - 19 - B4B		
			Packaging 2 - 20 - B4B		
			Packaging 2 - 21 - B4B		
			Packaging 2 - 22 - B4B		
			Packaging 2 - 23 - B4B		
			Packaging 2 - 24 - B4B		
			Packaging 2 - 25 - B4B		
			Packaging 2 - 26 - B4B		
			Packaging 2 - 27 - B4B		
			Packaging 2 - 28 - B4B		
			Packaging 2 - 29 - B4B		
			Packaging 2 - 30 - B4B		
			Packaging 2 - 31 - B4B		
			Packaging 2 - 32 - B4B		
			Packaging 2 - 33 - B4B		
			Packaging 2 - 34 - B4B		
			Packaging 2 - 35 - B4B		

				Packaging 2 - 36 - B4B	
200 QC 6	1 pcs	1/11/19	0.00 0.00	QC 6 - 38	
				QC 6 - 42	
				QC 6 - 9	DAS
				QC 6 - 68	MAR 25 2019 68
				QC 6 - 61	9-89
230 Spray Paint - 2 - B4B	1 pcs	1/11/19	0.00 1.36	Spray Paint - 1 - B4B	RD 19-3-23
				Spray Paint - 2 - B4B	
				Spray Paint - 3 - B4B	
				Spray Paint - 4 - B4B	
240 QC 14	1 pcs	1/11/19	0.00 0.00	QC 14 - 15	
				QC 14 - 2	
				QC 14 - 34	
				QC 14 - 38	
				QC 14 - 41	AS 19-3-24
				QC 14 - 51	
				QC 14 - 58	
				QC 14 - 59	
				QC 14 - 9	
242 Crosstubes - 5 - B4B	1 pcs	1/11/19	0.00 3.06	QC 14 - 68	
				Crosstubes - 1 - B4B	
				Crosstubes - 2 - B4B	
				Crosstubes - 3 - B4B	
				Crosstubes - 4 - B4B	RD 19-3-25
				Crosstubes - 5 - B4B	
244 QC 5	1 pcs	1/11/19	0.00 0.00	Crosstubes - 6 - B4B	
				QC 5 - 10	
				QC 5 - 12	
				QC 5 - 17	
				QC 5 - 18	
				QC 5 - 19	
				QC 5 - 22	
				QC 5 - 24	
				QC 5 - 3	
				QC 5 - 38	
				QC 5 - 42	
				QC 5 - 43	
				QC 5 - 49	
				QC 5 - 51	
				QC 5 - 58	
				QC 5 - 68	
				QC 5 - 9	RD 19-03-28
				QC 5 - 50	
				QC 5 - 30	
246 Spray Paint - 3 - B4B	1 pcs	1/11/19	0.00 1.36	Spray Paint - 1 - B4B	RD 19-4-7
				Spray Paint - 2 - B4B	
				Spray Paint - 3 - B4B	
				Spray Paint - 4 - B4B	
248 Spray Paint - 4 - B4B	1 pcs	1/11/19	0.00 1.36	Spray Paint - 1 - B4B	RD 19-4-7
				Spray Paint - 2 - B4B	
				Spray Paint - 3 - B4B	
				Spray Paint - 4 - B4B	
250 QC 14	1 pcs	1/11/19	0.00 0.00	QC 14 - 15	
				QC 14 - 2	
				QC 14 - 34	
				QC 14 - 38	
				QC 14 - 41	AS 19-4-8
				QC 14 - 51	
				QC 14 - 58	

252	Crosstubes - 6 - B4B	1 pcs	1/11/19	0.00 3.06	QC 14 - 59	
					QC 14 - 9	
					QC 14 - 68	
					Crosstubes - 1 - B4B	
					Crosstubes - 2 - B4B	
					Crosstubes - 3 - B4B	
					Crosstubes - 4 - B4B	- RD 19-4-8
260	QC 5	1 pcs	1/11/19	0.00 0.00	Crosstubes - 5 - B4B	
					Crosstubes - 6 - B4B	
					QC 5 - 10	
					QC 5 - 12	
					QC 5 - 17	
					QC 5 - 18	
					QC 5 - 19	
					QC 5 - 22	
					QC 5 - 24	
					QC 5 - 3	
					QC 5 - 38	
					QC 5 - 42	
					QC 5 - 43	
					QC 5 - 49	
					QC 5 - 51	
					QC 5 - 58	
					QC 5 - 68	DAS APR 08 2019 68 9-89
					QC 5 - 9	
					QC 5 - 50	
					QC 5 - 30	
275	DC - 1 - B4B	1 pcs	1/11/19	0.00 0.00	DC - 1 - B4B	NR
					DC - 2 - B4B	
290	Packaging 3-1 - Stock - B4B	1 pcs	1/11/19	0.00 0.00	Packaging 3 - 1 - B4B	
					Packaging 3 - 2 - B4B	
					Packaging 3 - 3 - B4B	
					Packaging 3 - 4 - B4B	
					Packaging 3 - 5 - B4B	
					Packaging 3 - 6 - B4B	
					Packaging 3 - 7 - B4B	
					Packaging 3 - 8 - B4B	
					Packaging 3 - 9 - B4B	
					Packaging 3 - 10 - B4B	
					Packaging 3 - 11 - B4B	
					Packaging 3 - 12 - B4B	
					Packaging 3 - 13 - B4B	
					Packaging 3 - 14 - B4B	
					Packaging 3 - 15 - B4B	
					Packaging 3 - 16 - B4B	
					Packaging 3 - 17 - B4B	
					Packaging 3 - 18 - B4B	
					Packaging 3 - 19 - B4B	
					Packaging 3 - 20 - B4B	
					Packaging 3 - 21 - B4B	
					Packaging 3 - 22 - B4B	• AS 19-4-8
					Packaging 3 - 23 - B4B	
					Packaging 3 - 24 - B4B	
					Packaging 3 - 25 - B4B	
					Packaging 3 - 26 - B4B	
					Packaging 3 - 27 - B4B	
					Packaging 3 - 28 - B4B	
					Packaging 3 - 29 - B4B	
					Packaging 3 - 30 - B4B	

				Packaging 3 - 31 - B4B	
				Packaging 3 - 32 - B4B	
				Packaging 3 - 33 - B4B	
				Packaging 3 - 34 - B4B	
				Packaging 3 - 35 - B4B	
				Packaging 3 - 36 - B4B	
300 QC 21 - FG	1 pcs	1/11/19	0.00 0.00	QC 21 - FG - 21	21
				QC 21 - FG - 70	9-28

APR 08 2019

Part Op 130 - CNC Bend Crosstube (CNC Alpha 160 Bender) Bend tube as per Dwg D119-796-141 using CNC bender program
Descriptions: 140 - QC15 (QC15- Crosstube Dimensional Check)

145 - Crosstubes-1 (Crosstubes) 1- CUT TUBE AT HEIGHT ON FAI SHEET 2- VERIFY HEIGHT: _____ BY QC15
LEVEL INSPECTOR: _____ 3- DEBURR CUT SURFACE

150 - ***** ENSURE PROPER JIG POSITIONING ***** ENSURE PROPER JIG POSITIONING
***** 1- DRILL TUBE AS PER DWG USING DT _____ 2- DRILL RIVET HOLES USING DT8787 FWD 3-
DEBURR AND C'SINK RIVET HOLES AS PER DWG 4- FLIP TUBE, REPEAT STEP 2 AND 3 5- SCRIBE PART# AND
BATCH# USING VIBRATING STYLUS ON INSIDE OF CUFF AS PER DWG D119-796-141 6- INSPECT AND REMOVE
ALL MARKS FROM TUBE WITHIN LIMITS ON DWG D119-796-141

160 - HandFinish5 (Crosstubes Chemical Conversion) ***IMMEDIATELY AFTER GRINDING*** 1- handfinish X-TUBE
INSIDE AND OUT 2- ALODINE AND ACID ETCH X-TUBE INSIDE AND OUT AS PER QSI005.

175 - QC7-1 (QC7-Inspect Chemical Conversion Coat)

180 - Outsource2 (Outsource process - NDT per QSI038 4.1) *** WEAR LATEX GLOVES WHEN HANDLING
CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 Or Issue P/O: 12803 LPI as per ASTM 1417 Level 2
Attach copy of NDT results to work order

190 - Packaging2 (Receive & Inspect for Damage & Mat'l Certs) Receive Ensure copy of NDT results attached to work
order.

200 - QC6 (QC6- All purchased or subcontracted products) *** WEAR LATEX GLOVES WHEN HANDLING
CROSSTUBE*** Inspect for damage & ensure results are as per Dwg D119-796-141

230 - Spray Paint (Spray Paint / NDT Room) ***VERIFY BY _____ BATCH # TO MATCH W/O

***VERIFY BY _____ PART # TO MATCH W/O _____ ***MASK SCRIBE
B# & P# AND VERIFY*** 1- Prime Inside of tube. 2- Install nut plates as per dwg (D2873-043) 3- Mask cuffs per note#2.
4- Prime exterior of tube per QSI005. Primer Batch: 5143304 Start Time: _____ Finish Time: _____

240 - QC14 (QC14- Inspect Spray Paint) ***VERIFY BY _____ BATCH # TO MATCH W/O _____

242 - Crosstubes-1 (Crosstubes) Assemble as per dwg D119-796-141 and Qsi 015 1- Abrade mating surfaces with
Scotch Brite 7447 and clean with Dupont 4105s or equivalent as per dwg. 2- Install D5152-041 with proseal 890 on
concave surface, 0.100" MIN thick as per dwg using DT10089 (identified right and left) *****MAINTAIN CLAMPING
PRESSURE ON FOR MIN 72HRS***** Proseal Batch: 5146134 EXP: 19-10 PROSEAL CURE
TIME 72 HOURS: Start: 19-3-25 Finish: 19-3-28 3- Install support and shim using
proseal 890 per dwg and clamp in position.

244 - QC5 (QC5- Inspect part completeness to step on W/O)***VERIFY BY _____ BATCH # TO MATCH W/O

246 - Spray Paint (Spray Paint / NDT Room) ***VERIFY BY _____ BATCH # TO MATCH W/O
1- Remove all non-fixed hardware and clean any excess proseal. 2- Scuff tube with Scotch Brite
7447. 3- Mask cuff per note#2. 4- Prime as per dwg and QSI005 5- Apply matte clear as per dwg and QSI005 Clear
Batch: _____

248 - Spray Paint (Spray Paint / NDT Room) ***VERIFY BY _____ BATCH # TO MATCH W/O
1- Mask underside of tube as per dwg. Mask cuff per note#2. 2- Scuff tube with Scotch Brite 7447

3- Paint outside of crosstube Paint Batch: 146096

250 - QC14 (QC14- Inspect Spray Paint) ***VERIFY BY _____ BATCH # TO MATCH W/O _____

252 - Crosstubes-1 (Crosstubes) 1- Re-install non fixed hardware per dwg ***Torque all clamps to 80-100 IN-LBS.*** 2-
Apply a filet-seal of proseal 890 around supports. Allow proseal to dry before inspecting. Proseal 890
Batch: 5146134 EXP: 10/19 PROSEAL CURE TIME 72 HOURS:
Start: _____ Finish: _____

260 - QC5 (QC5- Inspect part completeness to step on W/O) ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL
HAS CURED AS PER DWG.*** ***VERIFY BY _____ BATCH # TO MATCH W/O _____

275 - DC (Document Control) Photocopy bluefile and create labels as per PPP D119-796-141 chg 004

290 - Packaging3-1 (Identify as per dwg & Stock Location: _____) Identify and pack for shipping as per PPP D119-796-
141

300 - QC21 (QC21- Final Inspection - Work Order Release)

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D119-796-141TRN	Crosstube Turning Detail	1 Ea (1 ea)	130-Crosstubes - Bend - 1	143623.
CR3212-4-08	Rivet	16 Ea (16 ea)	242-Crosstubes - 5 - B4B	
D2873-043	Nut Plate Assembly	4 Ea (4 ea)	242-Crosstubes - 5 - B4B	
D5123-3	Clamp Cushion	4 pcs (4 ea)	242-Crosstubes - 5 - B4B	
D5124-1	Fwd Support	2 pcs (2 ea)	242-Crosstubes - 5 - B4B	
D5152-041	Fwd Post Mount Assembly	2 pcs (2 ea)	242-Crosstubes - 5 - B4B	
D5305-1	Shim	2 Ea (2 ea)	242-Crosstubes - 5 - B4B	
MS21920-24	Clamp	4 Ea (4 ea)	242-Crosstubes - 5 - B4B	

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
130-Crosstubes - Bend - 1	D119-796-141TRN	1	5	0
242-Crosstubes - 5 - B4B	CR3212-4-08	16 5115597	105	0
	D2873-043	4 145879	58	0
	D5123-3	4 079324	205	0
	D5124-1	2 241939	4	0
	D5152-041	2 161406	0	0
	D5305-1	2 5144003	14	0
	MS21920-24	4 065334	31	0

Part Specifications

Spec No	Description	Target/Tolerance	Limits	Type	Special Comments
1	Crosstube Assembly (AW119 MKI Fwd)	6.000Inches ± 0.030	6.030 5.970		
2	Crosstube Assembly (AW119 MKI Fwd)	2.516Inches ± 0.005	2.521 2.511		
3	Crosstube Assembly (AW119 MKI Fwd)	2.333Inches + 0.005 - 0.000	2.338 2.333		
4	Crosstube Assembly (AW119 MKI Fwd)	2.333Inches + 0.005 - 0.000	2.338 2.333		
5	Crosstube Assembly (AW119 MKI Fwd)	2.408Inches + 0.005 - 0.000	2.413 2.408		
6	Crosstube Assembly (AW119 MKI Fwd)	2.502Inches + 0.005 - 0.000	2.507 2.502		
7	Crosstube Assembly (AW119 MKI Fwd)	2.596Inches + 0.005 - 0.000	2.601 2.596		
8	Crosstube Assembly (AW119 MKI Fwd)	2.596Inches + 0.005 - 0.000	2.601 2.596		
9	Crosstube Assembly (AW119 MKI Fwd)	6.000Inches ± 0.030	6.030 5.970		
10	Crosstube Assembly (AW119 MKI Fwd)	2.516Inches ± 0.005	2.521 2.511		
11	Crosstube Assembly (AW119 MKI Fwd)	2.333Inches + 0.005 - 0.000	2.338 2.333		
12	Crosstube Assembly (AW119 MKI Fwd)	2.333Inches + 0.005 - 0.000	2.338 2.333		
13	Crosstube Assembly (AW119 MKI Fwd)	2.408Inches + 0.005 - 0.000	2.413 2.408		
14	Crosstube Assembly (AW119 MKI Fwd)	2.502Inches + 0.005 - 0.000	2.507 2.502		
15	Crosstube Assembly (AW119 MKI Fwd)	2.596Inches + 0.005 - 0.000	2.601 2.596		
16	Crosstube Assembly (AW119 MKI Fwd)	2.596Inches + 0.005 - 0.000	2.601 2.596		
17	Crosstube Assembly (AW119 MKI Fwd)	102.260Inches ± 0.020	102.280 102.240		



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D119-796-141
Job Sheet 187562



Part No: D119-796-141

Job Qty: 1 ea

Part Name: Fwd Crosstube Installation Without Step (No Hardware)



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 12/7/18

Job Tracking No:

Due Date: 1/11/19

Created By: Jesse White

Type: Stock

Description:

Note: DRWG D119-795-141 REV.H IPP REV:C 14.11.19 AS PER REV.C DD VERF:JLM IPP REV:D 14.12.12 AS PER REV.pd1 DD VERF:JLM IPP REV:E 15.02.11 AS PER REV F JLM VERIFIED BY:DD

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea		1/11/19	0.00	0.00	Start Up Crosstubes-1		
130	CNC Bend Crosstubes	1 pcs		1/11/19	0.00	3.85	CNC Bend Crosstube		
140	QC	1 pcs		1/11/19	0.00	0.00	QC15		
145	Crosstubes	1 pcs		1/11/19	0.00	3.06	Crosstubes-1		
150	Crosstubes	1 pcs		1/11/19	0.00	3.06	Crosstubes-1		
160	HandFXtube	1 pcs		1/11/19	0.00	1.49	HandFinish5		
175	QC	1 pcs		1/11/19	0.00	0.00	QC7-1		
180	Outsource	1 pcs		1/11/19			SKY002-VC	2	
190	Packaging	1 pcs		1/11/19	0.00	0.00	Packaging1-1		
200	QC	1 pcs		1/11/19	0.00	0.00	QC5		
230	SprayPaint	1 pcs		1/11/19	0.00	1.36	Spray Paint		
240	QC	1 pcs		1/11/19	0.00	0.00	QC14		
242	Crosstubes	1 pcs		1/11/19	0.00	3.06	Crosstubes-1		
244	QC	1 pcs		1/11/19	0.00	0.00	QC5		
246	SprayPaint	1 pcs		1/11/19	0.00	1.36	Spray Paint		
248	SprayPaint	1 pcs		1/11/19	0.00	1.36	Spray Paint		
250	QC	1 pcs		1/11/19	0.00	0.00	QC14		
252	Crosstubes	1 pcs		1/11/19	0.00	3.06	Crosstubes-1		
260	QC	1 pcs		1/11/19	0.00	0.00	QC5		
275	DC	1 pcs		1/11/19	0.00	0.00	DC		
290	Packaging	1 pcs		1/11/19	0.00	0.00	Packaging3-1		
300	QC21-FG	1 Ea		1/11/19	0.00	0.00	QC21		

Part Op 130 - Bend tube as per Dwg D119-796-141 using CNC bender program

Descriptions: 145 - 1- CUT TUBE AT HEIGHT ON FAI SHEET 2- VERIFY HEIGHT: _____ BY QC15 LEVEL

INSPECTOR: _____ 3- DEBURR CUT SURFACE

150 - ***** ENSURE PROPER JIG POSITIONING ***** ENSURE PROPER JIG POSITIONING

***** 1-DRILL TUBE AS PER DWG USING DT _____ 2- DRILL RIVET HOLES USING DT8787 FWD 3- DEBURR AND C'SINK RIVET HOLES AS PER DWG 4- FLIP TUBE, REPEAT STEP 2 AND 3 5- SCRIBE PART# AND BATCH# USING VIBRATING STYLUS ON INSIDE OF CUFF AS PER DWG D119-796-141 6- INSPECT AND REMOVE ALL MARKS FROM TUBE WITHIN LIMITS ON DWG D119-796-141

160 - ***IMMEDIATELY AFTER GRINDING*** 1- handfinish X-TUBE INSIDE AND OUT 2- ALODINE AND ACID ETCH X-TUBE INSIDE AND OUT AS PER QSI005.

Plex 12/7/18 2:26 PM dart.white.jesse

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date :	Sequence #:	QTY Affected :		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					

- 180 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 0380r Issue P/O: _____ LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order
- 190 - Ensure copy of NDT results attached to work order.
- 200 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Inspect for damage & ensure results are as per Dwg D119-796-141
- 230 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____ ***VERIFY BY _____ PART # TO MATCH W/O _____ ***MASK SCRIBE B# & P# AND VERIFY*** 1- Prime Inside of tube. 2- Install nut plates as per dwg (D2873-043) 3- Mask cuffs per note#2. 4- Prime exterior of tube per QSI005. Primer Batch: 5193304 Start Time: _____ Finish Time: _____
- 240 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____
- 242 - Assemble as per dwg D119-796-141 and Qsi 015 1- Abrade mating surfaces with Scotch Brite 7447 and clean with Dupont 4105s or equivalent as per dwg. 2- Install D5152-041 with proseal 890 on concave surface, 0.100" MIN thick as per dwg using DT10089 (identified right and left) ****MAINTAIN CLAMPING PRESSURE ON FOR MIN 72HRS**** Proseal Batch: 146134 EXP: 19/10 PROSEAL CURE TIME 72 HOURS: Start: 19-3-25 Finish: 19/3/28 3- Install support and shim using proseal 890 per dwg and clamp in position.
- 244 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____
- 246 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____ 1- Remove all non-fixed hardware and clean any excess proseal. 2- Scuff tube with Scotch Brite 7447. 3- Mask cuff per note#2. 4- Prime as per dwg and QSI005 5- Apply matte clear as per dwg and QSI005 Clear Batch: _____
- 248 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____ 1- Mask underside of tube as per dwg. Mask cuff per note#2. 2- Scuff tube with Scotch Brite 7447 3- Paint outside of crosstube Paint Batch: _____
- 250 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____
- 252 - 1- Re-install non fixed hardware per dwg ***Torque all clamps to 80-100 IN-LBS.*** 2- Apply a filet-seal of proseal 890 around supports. Allow proseal to dry before inspecting. Proseal 890 Batch: _____ EXP: _____ PROSEAL CURE TIME 72 HOURS: Start: _____ Finish: _____
- 260 - ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED AS PER DWG.*** ***VERIFY BY _____ BATCH # TO MATCH W/O _____
- 275 - Photocopy bluefile and create labels as per PPP D119-796-141 chg 004
- 290 - Identify and pack for shipping as per PPP D119-796-141

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D119-796-141TRN	Crosstube Turning Detail	1 Ea (1 ea)	90-Start up Operation	
CR3212-4-08	Rivet	16 Ea (16 ea)	242-Crosstubes	
D2873-043	Nut Plate Assembly	4 Ea (4 ea)	242-Crosstubes	
D5123-3	Clamp Cushion	4 Ea (4 ea)	242-Crosstubes	
D5124-1	Fwd Support	2 Ea (2 ea)	242-Crosstubes	
D5152-041	Fwd Post Mount Assembly	2 Ea (2 ea)	242-Crosstubes	
D5305-1	Shim	2 Ea (2 ea)	242-Crosstubes	
MS21920-24	Clamp	4 Ea (4 ea)	242-Crosstubes	

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D119-796-141TRN	1	5	0
242-Crosstubes	CR3212-4-08	16 <u>115597</u>	169	0
	D2873-043	4 <u>135133</u>	65	0
	D5123-3	4 <u>074324</u>	253	0
	D5124-1	2 <u>091939</u>	12	0
	D5152-041	2 <u>161400</u>	6	0
	D5305-1	2	13	0
	MS21920-24	4 <u>065334</u>	56	0

5653

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date :	Sequence #:	QTY Affected :		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐ ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled		FAULT CATEGORY ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					

Part Specifications					
Spec No	Description	Target/Tolerance	Limits	Type	Special Comments
1	Crosstube Assembly (AW119 MKI Fwd)	6.000Inches $\pm$ 0.030	6.030 5.970		
2	Crosstube Assembly (AW119 MKI Fwd)	2.516Inches $\pm$ 0.005	2.521 2.511		
3	Crosstube Assembly (AW119 MKI Fwd)	2.333Inches $\pm$ 0.005 - 0.000	2.338 2.333		
4	Crosstube Assembly (AW119 MKI Fwd)	2.333Inches $\pm$ 0.005 - 0.000	2.338 2.333		
5	Crosstube Assembly (AW119 MKI Fwd)	2.408Inches $\pm$ 0.005 - 0.000	2.413 2.408		
6	Crosstube Assembly (AW119 MKI Fwd)	2.502Inches $\pm$ 0.005 - 0.000	2.507 2.502		
7	Crosstube Assembly (AW119 MKI Fwd)	2.596Inches $\pm$ 0.005 - 0.000	2.601 2.596		
8	Crosstube Assembly (AW119 MKI Fwd)	2.596Inches $\pm$ 0.005 - 0.000	2.601 2.596		
9	Crosstube Assembly (AW119 MKI Fwd)	6.000Inches $\pm$ 0.030	6.030 5.970		
10	Crosstube Assembly (AW119 MKI Fwd)	2.516Inches $\pm$ 0.005	2.521 2.511		
11	Crosstube Assembly (AW119 MKI Fwd)	2.333Inches $\pm$ 0.005 - 0.000	2.338 2.333		
12	Crosstube Assembly (AW119 MKI Fwd)	2.333Inches $\pm$ 0.005 - 0.000	2.338 2.333		
13	Crosstube Assembly (AW119 MKI Fwd)	2.408Inches $\pm$ 0.005 - 0.000	2.413 2.408		
14	Crosstube Assembly (AW119 MKI Fwd)	2.502Inches $\pm$ 0.005 - 0.000	2.507 2.502		
15	Crosstube Assembly (AW119 MKI Fwd)	2.596Inches $\pm$ 0.005 - 0.000	2.601 2.596		
16	Crosstube Assembly (AW119 MKI Fwd)	2.596Inches $\pm$ 0.005 - 0.000	2.601 2.596		
17	Crosstube Assembly (AW119 MKI Fwd)	102.260Inches $\pm$ 0.020	102.280 102.240		

Plex 12/7/18 2:26 PM dart.white.jesse

Entered: _____ Date: _____



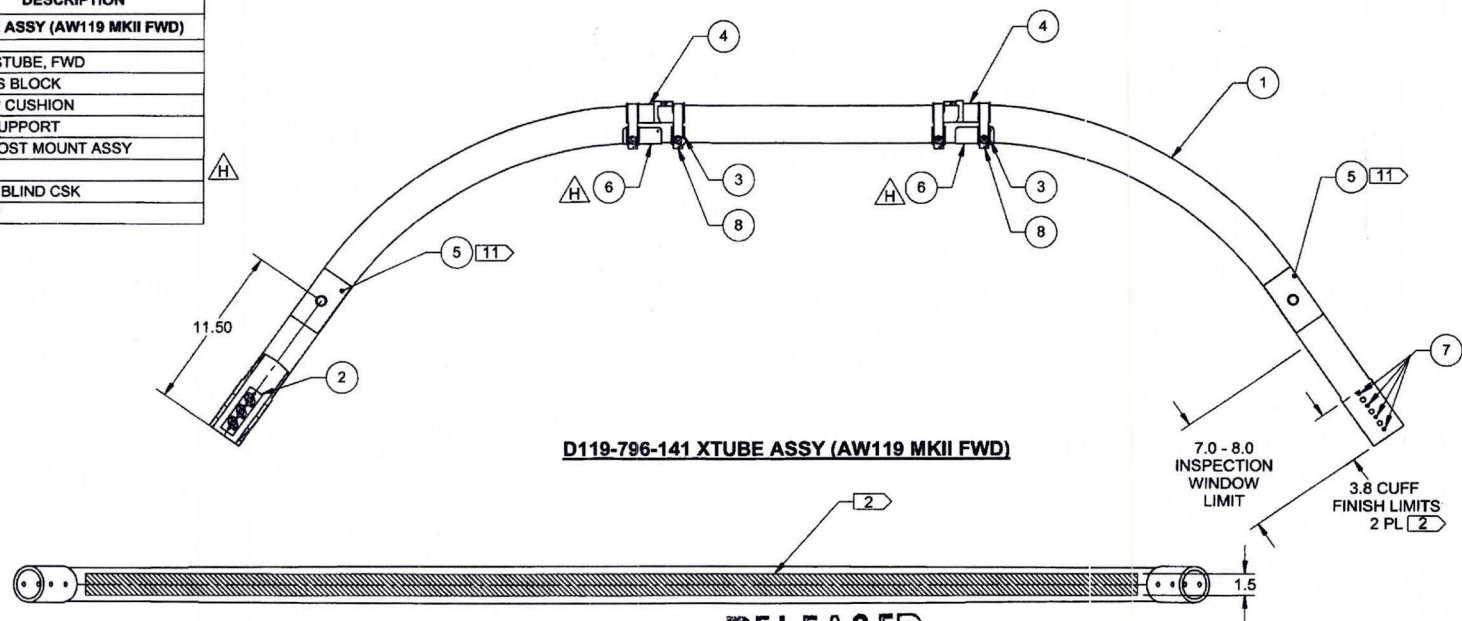
WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date :	Sequence #:	QTY Affected :		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Presservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐ ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled		FAULT CATEGORY ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					

ITEM	QTY	P/N	DESCRIPTION
	X	D119-796-141	XTUBE ASSY (AW119 MKII FWD)
1	1	D119-796-141BND	CROSSTUBE, FWD
2	4	D2873-043	RADIUS BLOCK
3	4	D5123-3	CLAMP CUSHION
4	2	D5124-1	FWD SUPPORT
5	2	D5152-041	FWD POST MOUNT ASSY
6	2	D5305-1	SHIM
7	16	CR3212-4-08	RIVET, BLIND CSK
8	4	MS21920-24	CLAMP



D119-796-141 XTUBE ASSY (AW119 MKII FWD)

NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: APPLY MATTE CLEAR COAT PER QSI 005 4.2
MASK D5124-1 FWD SUPPORTS, D5305-1 SHIMS AS WELL AS UNDERSIDE OF CROSSTUBE AS SHOWN (B3-1, HATCHED AREA),
PAINT OUTSIDE PER DART QSI 005 4.2 AFTER APPLYING CLEAR COAT
DO NOT APPLY FINISH (PAINT OR CLEAR COAT) TO CUFFS IN LOCATION SHOWN, MASK PRIOR TO FINISHING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY USING PART NUMBER "D119-796-141" AND BATCH NUMBER ON INSIDE OF CUFF PER QSI 044 6.4
- 7) WEIGHT: 18.54 lbs
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE.
THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM DEFECTS SUCH AS SCRATCHES, NICKS OR DENTS.
DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 9) PRIOR TO FINISHING, ABRASE MATING SURFACES OF D5124-1 FWD SUPPORTS AND CROSSTUBE WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH'N'WIPE DEGREASER. APPLY A 0.1 MIN THK LAYER OF PROSEAL 890 ON THE INSIDE CONCAVE SURFACE OF THE D5124-1 FWD SUPPORTS AND INSTALL AT AN 8.4" OFFSET FROM THE CROSSTUBE BENDING PLANE. INSTALL THE MS21920-24 CLAMPS AND D5123-3 CLAMP CUSHIONS WHILE WET.
- 10) TORQUE MS21920 CLAMPS 80 - 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY, THE NUT IS FACING AFT AND HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.
- 11) PRIOR TO FINISHING, ABRASE MATING SURFACES OF CROSSTUBE AND D5152-041 WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH'N'WIPE DEGREASER. INSTALL D5152-041 WITH LAYER OF PROSEAL 890 ON INSIDE CONCAVE SURFACE, 0.1 MIN THK. LOCATE D5152-041 USING TOOL DT10089.
- 12) PRIOR TO FINISHING, ABRASE MATING SURFACES OF CROSSTUBE AND D5305-1 SHIM WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH'N'WIPE DEGREASER. INSTALL D5305-1 SHIM WITH LAYER OF PROSEAL 890 ON INSIDE CONCAVE SURFACE, 0.1 MIN THK. USE ADDITIONAL TEMPORARY MS21920-24 CLAMP TO APPLY CLAMPING PRESSURE FOR 72 HOURS.

RELEASED
2015-11-04
ECN 15-642

H	ADD D5305-1 SHIM, D8024-103 WAS D8005-103, D5124-1 NOW INSTALLED ON PRIMER	AP	15.10.13
G	FINISHING OFIDER ADJUSTED, CR3212-4-08 WAS -07, CUFF DIA TOLERANCE INCREASED TO +/- 0.005	AP	15.04.24
F	REMOVED PRIME/PAINT ON CUFFS, 2.516 WAS 2.500 (C8-5)	AP	15.02.03
E	D5152-041 FWD STEP POST ASSY WAS D5150-1 STEP POST. SCOTCH BRITE 7447 RED WAS 180 GRIT SANDPAPER, ANGLE (B7-2) DIMENSIONED FROM NEW DATUM	DB	15.01.15
D	ADD D5150-1 STEP POST (2X), MOVED INSPECTION WINDOW DETAIL TO SHEET 1, MODIFIED NOTES ON SHT 1 & 3	DB	14.11.25
C	CR3212-4-07 RIVETS WERE CR3212-4-09, 7.5 DEG CUFF ANGLE OFFSET REMOVED (SHT 3), CUFF DIAMETER ON D119-796-141 TRN REDUCED TO 2.500, ADDED INSPECTION WINDOW (B7-3), ADDED SHT 4	AP	14.10.23
B	ADDED D2873-043 RADIUS BLOCK, CR3212-4-09 RIVETS, ADDED SKIDTUBE REFERENCE FOR LOCATING CUFF HOLES, RE-ORGANIZED NOTES AND REMOVED REDUNDANT INFORMATION	AP	14.09.02
A	NEW ISSUE	AP	14.08.09
REV.	DESCRIPTION	BY	DATE
DESIGN	AP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AP		
CHECKED	AJS	DRAWING NO.	REV. H
MFG. APPR.	JLM	D119-796-141	SHEET 1 OF 6
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII FWD)	NTS
DATE	15.10.13	COPYRIGHT © 2014 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

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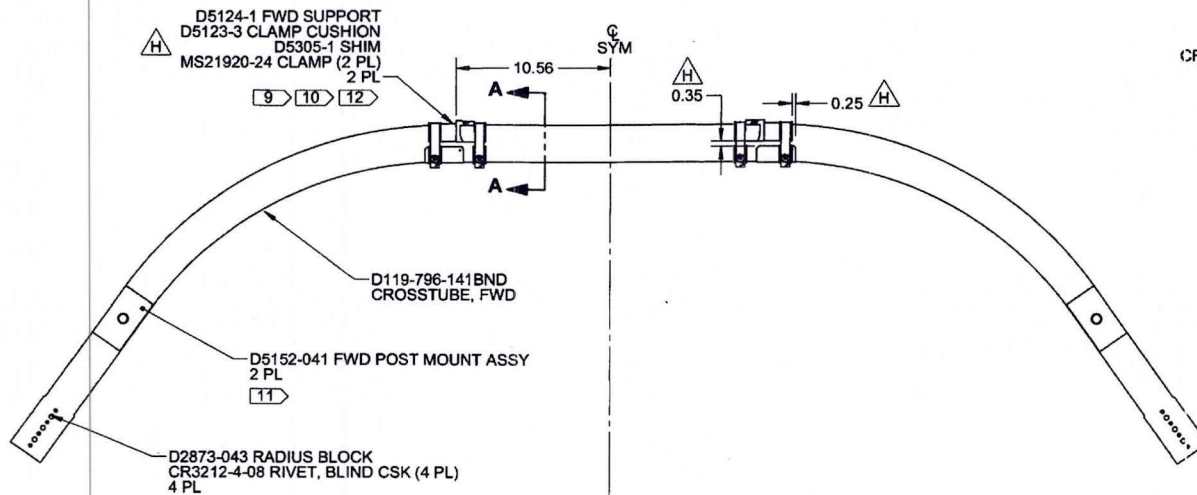


WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

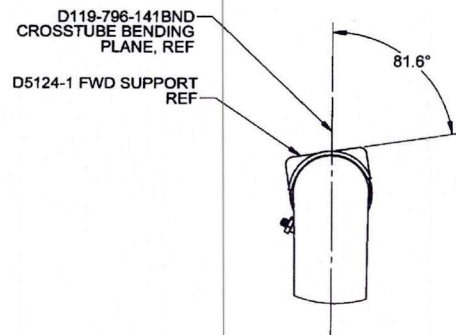
NCR No. _____

Route update only ☐

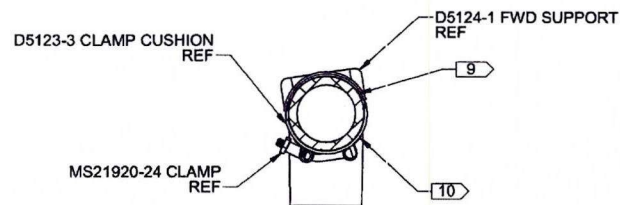
Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					



D119-796-141 XTUBE ASSY (AW119 MKII FWD)



DETAIL B
SCALE 2X



SECTION A-A
SCALE 2X

RELEASED
2015-11-04

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DESIGN	AP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AP		
CHECKED	AJS	DRAWING NO.	REV. H
MFG. APPR.	JLM	D119-796-141	SHEET 2 OF 8
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII FWD)	NTS
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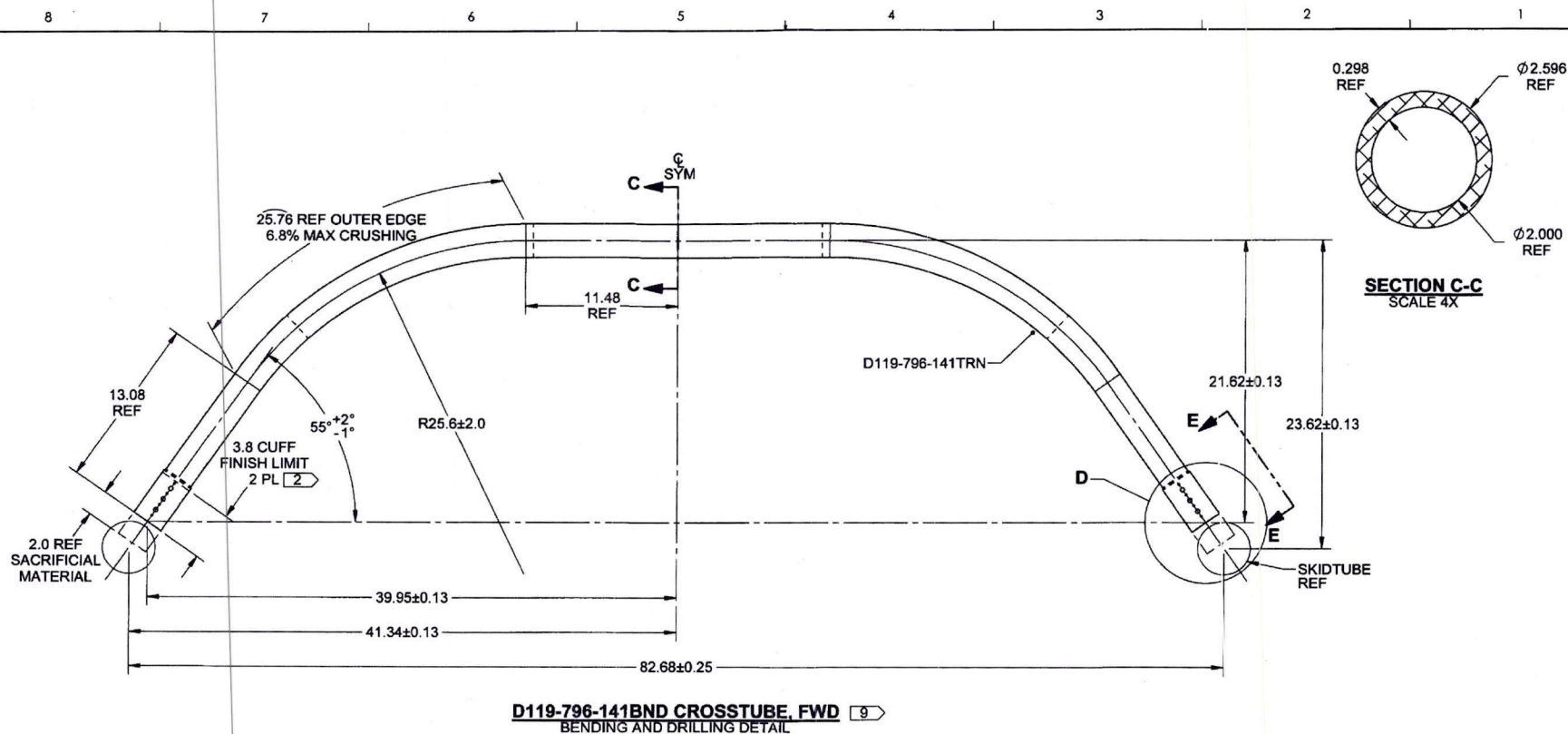


WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date :	Sequence #:	QTY Affected :		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Presservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					



NOTES:

- 1) MATERIAL: MADE FROM D119-796-141TRN
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
DO NOT APPLY PRIMER TO CUFFS IN LOCATION SHOWN, MASK PRIOR TO FINISHING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 16.70 lbs
- 8) PART IS SYMMETRICAL ABOUT CENTERLINE
- 9) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6.8% BASED ON OD.
- 10) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038
- 11) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM DEFECTS SUCH AS SCRATCHES, NICKS OR DENTS. DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

RELEASED
2015-11-04

APPROVED

DESIGN	AP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	DRAWING NO. D119-796-141	REV. H
DRAWN	AP			
CHECKED	AJS			
MFG. APPR.	LM			
APPROVED	WM			
DE APPR.	DS			
DATE 15.10.13		XTUBE ASSY (AW119 MKII FWD)		
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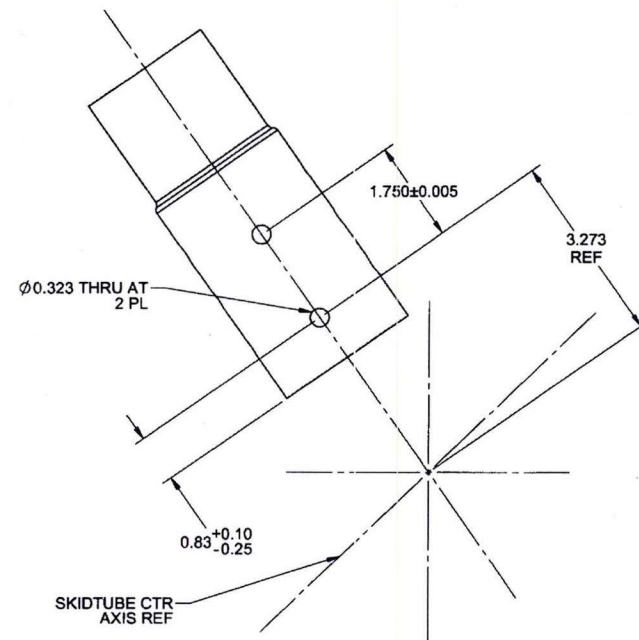
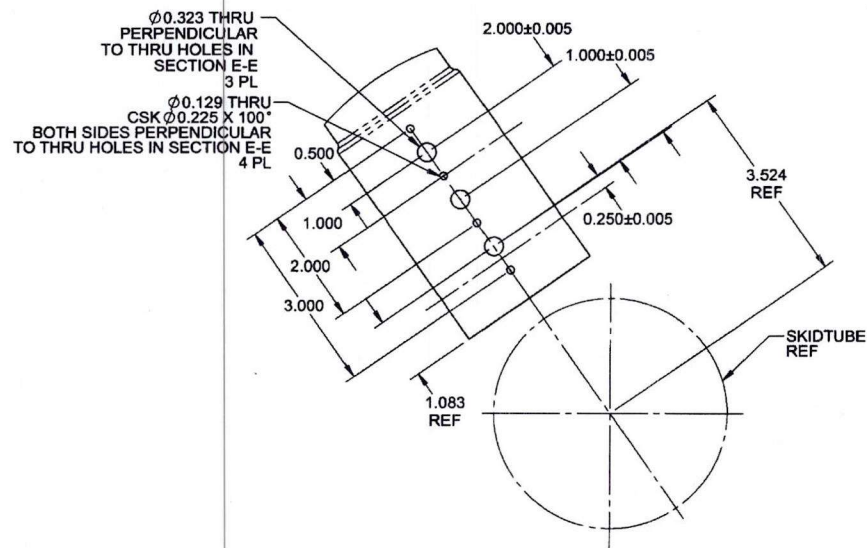


WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐ ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled		FAULT CATEGORY ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					



RELEASED
2015-11-04

APPROVED

DESIGN	AP	DART AEROSPACE LTD	
DRAWN	AP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	AJS	DRAWING NO.	REV. H
MFG. APPR.	JLM	D119-796-141	SHEET 4 OF 6
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII FWD)	NTS
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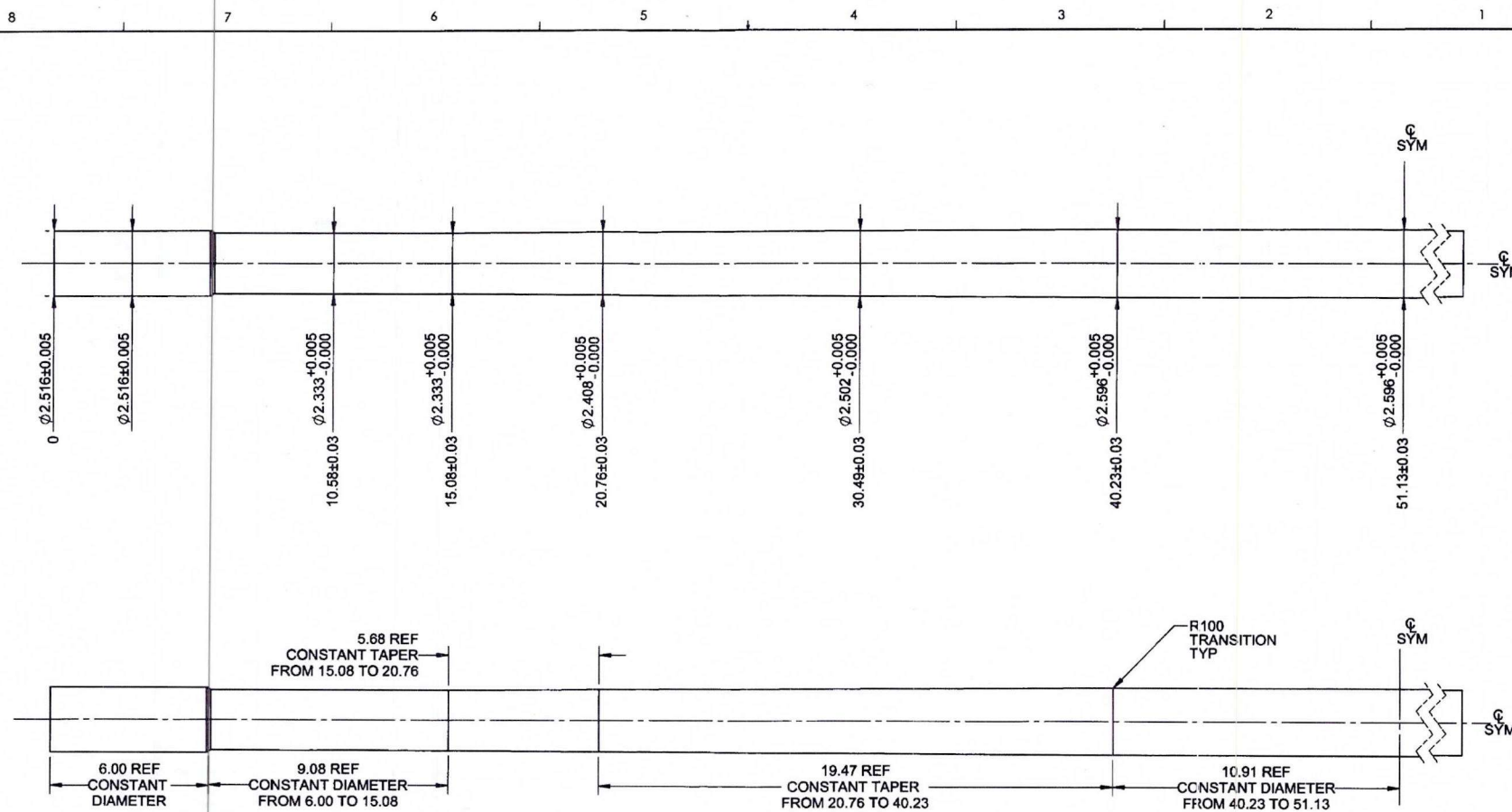


WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

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Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐ ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled		FAULT CATEGORY ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					



D119-796-141TRN CROSSTUBE, FWD

NOTES:

- 1) MATERIAL: MANUFACTURE FROM D6024-103 (PREFERRED) OR D6005-103
FINISHED LENGTH = 102.26 ± 0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 16.70 lbs
- 8) PART IS SYMMETRICAL ABOUT CENTERLINE

RELEASED
2015-11-04

APPROVED

DESIGN	AP	DART AEROSPACE LTD	
DRAWN	AP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	AJS	DRAWING NO.	REV. H
MFG. APPR.	JLM	D119-796-141	SHEET 5 OF 6
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII FWD)	NTS
DATE	15.10.13	COPYRIGHT © 2014 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					

CHAMFER ID
AS REQUIRED
FOR TOOLING

F

SYM

SYM

0.258 REF
NOMINAL WALL

0.167 REF
NOMINAL WALL

0.167 REF
NOMINAL WALL

0.204 REF
NOMINAL WALL

0.251 REF
NOMINAL WALL

0.298 REF
NOMINAL WALL

0.298 REF
NOMINAL WALL

0

10.58±0.03

15.08±0.03

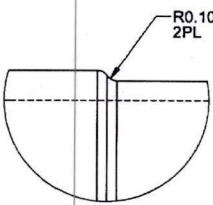
20.76±0.03

30.48±0.03

40.23±0.03

51.13±0.03

D119-796-141TRN CROSSTUBE, FWD
SUPPLEMENTAL VIEW: NOMINAL WALL THICKNESS



DETAIL F
SCALE 2X

RELEASED
2015-11-04

APPROVED

DESIGN	AP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AP		
CHECKED	AJS	DRAWING NO.	REV. H
MFG. APPR.	JLM	D119-796-141	SHEET 6 OF 6
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII FWD)	NTS
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Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

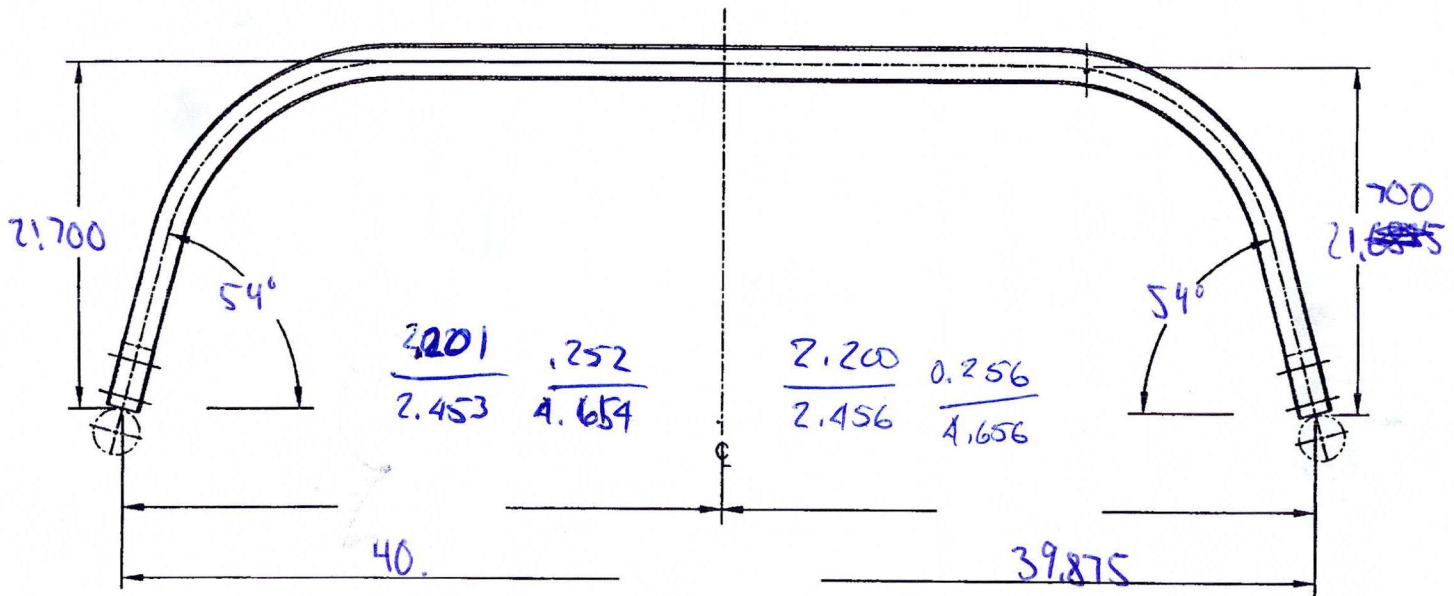
NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date :	Sequence #:	QTY Affected :		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐ ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled		FAULT CATEGORY ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					

DART AEROSPACE LTD		Work Order:	
Description: Crosstube Fwd, with Step		Part Number:	D119-796-141
Inspection Dwg: D119-796-141 Rev: H		Page 1 of 1	

Required Dimension	Min	Max
Height	21.490	21.750
1/2 Span	39.820	40.080
Angle	54°	57°
Total Span	79.640	80.160
Bending Passes	8	
Crushing	--	6.8%



	Side A	Side B
Bending Passes	11	11
Crushing	5.4%	5.5%
Comments		

QC15 Inspection	PD
Date	19.02.22

Rev	Date	Change	Revised by	Approved
A	15.04.14	New Issue	KJ	
B	15.11.12	Dwg Rev updated	KJ	
C	16.01.15	Dwg Rev updated	KJ	up

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube ☐</td> <td>Cross tube ☐</td> <td>Eng. (Non-AW) ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Water Jet ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Supplier ☐</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Quality ☐</td> </tr> </table>			Skid-tube ☐	Cross tube ☐	Eng. (Non-AW) ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Water Jet ☐	Large Fab ☐	Finishing ☐	Rec/Store/Packaging ☐	Supplier ☐				Quality ☐																				
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Other/Details:																																								



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER PO042823



Supplier: SKY002-VC
Skyservice
6120 Midfield Road
Mississauga
ON
L5P 1B1 Canada
Phone: 905-678-5636
Fax: 905-678-5841

PO No: PO042823

PO Date: 3/7/19

Due Date: 3/12/19

**Purchase Order
Revision:**

Revision Date:

Ship-To Contact: Phone:

E-MAILED
MAR 13 2019

Via: Ground

Pynt Terms: Net 30

Freight Terms:

Special Comments:

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	187562	D119-796-141	Fwd Crosstube Installation Without Step (No Hardware) : TC STC SH14-45-Issue 1, FAA STC SR03504NY 15/01/28, EASA STC 10052022 Revision 1 15/02/13, DGCA INDIA LoA 07-09/2011-AED (Part) 15/07/16, BRAZIL STC 2015S07-16 15/07/30, CAAP PHILIPPINES LoA 16/05/11, CHINA VSTC0757 16/07/22, RUSSIA STC CT316-A119 16/08/11, DGAC INDONESIA STC SR025 18/02/19 Outsource2 (Outsource process - NDT per QSI038 4.1) *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038Or Issue P/O: _____ LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	-	3/12/19	1 pcs	0 pcs	1 pcs	\$208.75/pcs	\$208.75
	187561			Firmed	-	3/12/19	1 pcs	0 pcs	1 pcs	\$208.75/pcs	\$208.75
Sub Total:							2	0	2		\$417.50

DAS
68
9-89



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER
PO042823



Items											
Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
2	187569	D119-796-241	Aft Crosstube Installation Without Step (No Hardware) : TC STC SH14-45-Issue 1, FAA STC SR03504NY 15/01/28, EASA STC 10052022 Revision 1 15/02/13, DGCA INDIA LoA 07-09/2011-AED (Part) 15/07/16, BRAZIL STC 2015S07-16 15/07/30, CAAP PHILIPPINES LoA 16/05/11, CHINA VSTC0757 16/07/22, RUSSIA STC CT316-A119 16/08/11, DGAC INDONESIA STC SR025 18/02/19 *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***	Firmed	-	3/12/19	1 pcs	0 pcs	1 pcs	\$208.75/pcs	\$208.75
	187570			Firmed	-	3/12/19	1 pcs	0 pcs	1 pcs	\$208.75/pcs	\$208.75
Sub Total:							2	0	2	\$417.50	

Grand Total: \$835.00

Order Notes

Procurement Quality Clauses

A005 right of entry
A012 chemical and physical test report
A016 personnel qualification
A017 raw material identification (as applicable)

A022 Apical Processing
A024 process certifications
A026 certification of material conformance

A041 quality management system
A042 dart notification by supplier
A043 retention of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 3/13/19 8:19 AM dart.lavoie.chantal

**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO39578	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: PO42823
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT INSPECTION (LIQUID PENETRANT) ON 4 CROSSTUBES

ITEM ID: D119-796-241 AFT CROSSTUBE

1 - WORK ORDER ID#: 187570

2 - WORK ORDER ID#: 187569

ITEM ID: D119-796-141 FWD CROSSTUBE

3 - WORK ORDER ID#: 187561

4 - WORK ORDER ID#: 187562

DAS
68
9-89

Action Taken:						Date:	Initial/Stamp:
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE (ITEMS 1-4) AS PER ASTM1417M-16						MAR 08 2019	DOT-APP 61 53-89
NO CRACK FOUND							
PEN ZL-37, MPO23206, CLEANER SKC-S MPO15030, EMU. MPO15896, DEV. MPO23451, UV LIGHT M-20142							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:		ACA/SCA Stamp	Date:
Name: ANTONINO MARCHETTA		DOT-APP 61 53-89	MAR 08 2019